

CLAIMS

1. A drug delivery system comprising a contact lens having dispersed therein as nanoparticles an ophthalmic drug nanoencapsulated in a material from which said ophthalmic drug is capable of diffusion into and migration through said contact lens and into the post-lens tear film when said contact lens is placed on the eye.
2. The drug delivery system of claim 1 wherein said nanoparticles are of a size and are dispersed within said contact lens in an amount such that said lens remains substantially optically transparent.
3. The drug delivery system of claim 2 wherein said amount of nanoparticles is from about 1 to about 5%, by weight, based on the weight of the contact lens.
4. The drug delivery system of claim 1 wherein said contact lens is a soft contact lens.
5. The drug delivery system of claim 4 wherein said contact lens comprises poly 2-hydroxyethylmethacrylate.
6. The drug delivery system of claim 1 wherein said ophthalmic drug is lidocaine, timolol, ciproflaxin, cyclosporin A, pilocarpine, antiparasitic or anti-protozoal drugs such as ivermectin, pyrimethamine, steroids such as prednisilone acetate, non-steroids such as acular, voltaren, antibiotics such as ciloxan, gentamycin, cephalosporins and the like or mixtures thereof.

7. The drug delivery system of claim 1 wherein said ophthalmic drug is nanoencapsulated in an oil-in-water emulsion.

8. The drug delivery system of claim 7 wherein said encapsulation material is chitosan nanoparticles, human serum albumin nanoparticles, biodegradable poly (alkylcyanoacrylates), polybutylcyanoacrylate, polyhexylcyanoacrylate, polyethylcyanoacrylate, (polyisobutylcyanoacrylate), polycyanoacrylate, silica nanospheres, PEG'ylated core-shell nanoparticles, biodegradable PLGA (poly(D,L-lactide-co-glycolide)) particles, (poly lactic acid), PGA, PLG (poly(D,L- glycolide)) polymeric nanoparticles, microemulsion nanodroplets, liposomes, biocompatible gliadin nanoparticles, low pH sensitive PEG stabilized plasmid-lipid nanoparticles, biodegradable calcium phosphate, legumin, tocopherol derivatives stabilized nano-sized emulsion particles, polysaccherides grafted with Polyesters (amphyphilic copolymers), PLA-PEG nanoparticles, nanoparticles composed of hydrophilic proteins coupled with apolipoprotein E, biodegradable poly(ε-caprolactone) nanoparticles, poly(methylidene malonate), gelatin, poly(E-caprolactone), sodium alginate, agarose hydrogel, PMMA, biotinylated poly(ethylene glycol) conjugated with lactobionic acid, carboxymethyl dextran magnetic nanoparticles, poly(vinyl alcohol) hydrogel, biotinylated pullulan acetate, diblock copolymers or mixtures thereof.

9. A method of administering an ophthalmic drug to a patient in need thereof comprising placing on the eye thereof the drug delivery system of claim 1.

10. A kit comprising:
- a) a first component containing at least one drug delivery system of claim 1, and
 - b) a second component containing at least one storage container for said first component, said storage container additionally containing a material that substantially prevents said diffusion and migration of said ophthalmic drug during storage.
11. The kit of claim 10 wherein said material that substantially prevents said diffusion and migration of said ophthalmic drug is substantially saturated aqueous solution of said ophthalmic drug.
12. Use of the kit of claim 12 for the storage and delivery of ophthalmic drugs to the eye of a patient in need thereof.
13. A method of preparing the drug delivery system of claim 1 comprising:
- a) providing said nanoencapsulated ophthalmic drug, and
 - b) preparing said contact lens from materials that incorporate the nanoencapsulated ophthalmic drug, such that the nanoencapsulated ophthalmic drug is substantially uniformly dispersed throughout said contact lens.
14. An article of manufacture comprising packaging material and the ophthalmic drug delivery system of claim 1 contained within said packaging material, wherein said packaging material comprises a label which indicates that said ophthalmic drug delivery system can be used for ameliorating symptoms associated with pathologic conditions of the eye.

15. An article of manufacture comprising packaging material and the kit of claim 12 contained within said packaging material, wherein said packaging material comprises a label which indicates that said first component of said kit can be used for ameliorating symptoms associated with pathologic conditions of the eye and that said second component of said kit can be used for storage of said first component.